INCIDENCE AND OUTCOMES OF PREGNANCIES AMONG PREGNANT MOTHERS WITH PREVIOUS CESAREAN SCAR IN JIMMA UNIVERSITY SPECIALIZED HOSPITAL SOUTH WEST ETHIOPIA

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THESIS SUBMITTED TO DEPARTMENT OF OB/GYN, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENECES, JIMMA UNIVERSITY IN PARTIAL FULFILLMENTS OF THE REQUIREMENTS FOR THE SPECIALITY IN OBSTETRICS AND GYNECOLOGY.

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JIMMA ETHIOPIA

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Abstract

Background: *Caesarean section is a relatively common procedure in obstetric practice and has some adverse effects on future pregnancies. 8-10% of obstetrics population has a previous cesarean section. However, there is a paucity of information on the incidence and outcome of pregnancies among pregnant mothers with previous Caesarean section scar in Jimma University Specialized Hospital.*

Objectives: *To assess the incidence and outcomes of pregnancies among pregnant mothers with previous cesarean scar who delivered in obstetrics ward of Jimma University Specialized Hospital from January 1, 2013 to December 31, 2013.*

M**ethods:** *A hospital based descriptive cross sectional study was conducted on 258 pregnant mothers with pervious cesarean section from January 1, 2012 to December 31, 2013 in Jimma University Specialized Hospital. Data was collected by 10 trained Year II OB/ GYN residents using semi structured interviewer administered questionnaire and document review check list. Data was cleaned, edited, coded and entered to computer and analyzed by SPSS version 16.0 for window. Bivariate and multi variable logistic regression analysis was carried out to identify the independent predictors for the outcome of pervious cesarean section. Finally the results of the study were presented in frequency tables, bar graphs and texts. Significant association was declared at P<0.05.*

Result*: Among total delivery of 3854 the proportion of mothers with previous cesarean scar was 6.69%. 131(50.8%) of them were in age range of 25-29 years, 231(89.5%) had single previous cesarean scar, 252(97.7%) had antenatal care, 153(68.2%) were eligible for vaginal birth after cesarean with success rate of 69(52.3%). 37(24.7%) previous cesarean section scar + x-factors and 32(21.3%) prolonged latent* phase of *first stage of labor were major indication for the current cesarean section. 212(82.2%) pregnancies in mothers with previous scar had favorable maternal outcome respectively. Intrapartum complications were 18(7%) non-reassuring fetal heart rate pattern, 5(1.9%) uterine rupture and 2(0.8%) scar dehiscence while 3 (1.6%) hysterectomies and 1(0.5%) iatrogenic bladder injury were intra operative complication.13(6.9%)postpartum hemorrhage, 5(2.6%)endometirits, 2(1.1%) wound infection and 1(0.5%) dehiscence were among postoperative complications. Perinatal mortality rate was 3.25 per1000 total births. Address AOR= 0.7,95CI:0.2-0.9, eligibility for VBAC AOR=0.6,95CI:0.2-0.9 and intrapartum complications AOR=4.0,95CI:1.5-23 were significantly associated with outcome of mothers previous scar where as Birth Weight AOR=6,95CI:0.9-32.9 and first minute Apgar score AOR=5.7,95CI:1.9-16.8 were significantly associated with neonatal outcome at P<0.05*

Conclusion and recommendation*: The study revealed that lower proportion of pervious CS scar with variety of complications to mothers, fetuses and neonates. Strengthening of ANC follow up at hospital and other health facilities, better maternal record keeping and farther more comprehensive and extended study were recommended.*

Key words: ***Previous cesarean section, vaginal birth after cesarean, trial of labor after cesarean, elective repeat of cesarean section.***

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ACRONYMS

ACOG- American College of Obstetricians and Gynecologists.

ANC-Ante Natal Care

Apgar-American Pediatrics Gross Assessment Records

APH-Ante partum hemorrhage

CS- Cesarean Section.

CPD- Cephalopelvic Disproportion

EMCS- Emergency Cesarean section.

ERCS- Elective Repeat Cesarean section.

JUSH- Jimma University Specialized Hospital.

MAS- Meconium Aspiration Syndrome

NIH- National Institute of Health.

NRFHRP- Non reassuring Fetal Heart Rate Pattern.

PIH-Pregnancy Induced Hypertension

PROM-Premature Rupture of Membrane

PPH- Post Partum Hemorrhage

SPSS- Statistical Package of Social Sciences.

TOLAC- Trial of Labor after Cesarean delivery.

UK- United Kingdom

USA-United States of America

WHO- World Health Organization.

VBAC- Vaginal Birth after Cesarean.

CHAPTER ONE: INTRODUCTION

1.1. Background Information

Cesarean delivery is defined as the birth of a fetus through incisions in the abdominal wall (laparatomy) and the uterine wall (hysterotomy) to deliver one or more babies at or after 28 weeks of gestation (1,2).

The first modern Caesarean section was performed by German gynecologist Ferdinand Adolf Kehrer in 1881. Historically there is the dictum "Once a cesarean, always a cesarean" has largely permeated the obstetric practice for most of the twentieth century and today. Trial of labor after previous cesarean delivery (TOLAC) to achieve a vaginal birth was not considered a reasonable option until the 1970s to 1980s (1, 2, 3).

As the annual incidence of cesarean delivery increased from less than 5 per 100 live births during the 1970s to 23.5 per 100 live births in the United States in 1988, the National Institute of Health (NIH) and the World Health Organization (WHO) held consensus conferences in the 1980s and concluded that cesarean delivery rates were too high and that VBAC was an acceptable approach for reducing cesarean delivery. After this recommendations, the annual incidence of VBAC (defined as the number of VBACs per 100 women with a prior cesarean delivery per year) increased from 5/100 (5%) in 1985 to 28.3/100 (28.3%) in 1996(3, 4, 5).

At an individual level, successful VBAC is associated with a lower risk of maternal morbidity and fewer complications in future pregnancies; at a population level, VBAC is associated with an overall decrease in cesarean delivery. However, neither elective repeat cesarean delivery nor TOLAC is without risks (6, 7).

The recent Practice Bulletin by the American College of Obstetricians and Gynecologists (ACOG) on Vaginal Birth after Previous Cesarean Delivery recommended that "most women with one previous cesarean delivery with a low transverse incision are candidates for and should be counseled about VBAC and offered TOLAC (8).

Cesarean section is performed when safe vaginal delivery is either not feasible (absolute) or would impose undue risks to the mother or/ and fetus. The common indications include fetopelvic disproportion including CPD, failure to progress in labor, placenta

previa, fetal malposition and malpresentations, suspected fetal distress, cord prolapse, previous cesarean section, maternal infections (e.g. HIV, active Herpes simplex) (1,2,3).

Although cesarean section (CS) is considered to be relatively safe, maternal death, serious maternal complications which include postpartum hemorrhage, hysterectomy, serious wound infection, bladder injury, anesthesia complications, could be major maternal complication after previous CS. Moreover, birth trauma still occurred in newborns delivered by CS, including cerebral hemorrhage and bone fracture, lower Apgar score, and NIUC transfer (1, 2, 3).

1.2 STATEMENT OF PROBLEM

Caesarean section is a relatively common procedure in obstetric practice and has been a major source of interest and concern over the last 20 years. The concern arose because a worldwide trend of increasing CS rate has been seen since the early 1970s and vary worldwide, ranging from approximately 10% in Sweden to about 80% in private-sector hospitals in Brazil (5,6).

Over the years the indications for CS have widened from saving either the mothers or infants life or both to prevent immediate complications and contributed to high increasing rates of CS in many countries(6). Acceptable cesarean delivery rate worldwide is 5-15% of births. Africa has the lowest (<5%), in Ethiopia it ranges from 0.2% to 9% (3).
One of the major concerns relating to previous cesarean delivery is the potential of some adverse effects on future pregnancies. Abnormal placentation like morbid adherence of placenta (placenta accreta or percreta) is a rare but serious complication of placentation among women with previous cesarean section and anterior placenta previa. The overall incidence of severe placenta accreta (defined as resulting in death, hysterectomy, blood transfusion, coagulopathy or being associated with placenta percreta) was estimated as 0.05% and the odd ratio (OR) for women with repeated CS is 3.3%(8).

Cesarean sections for some time have been performed with impunity. Such deliveries are associated with immediate and delayed morbidity and mortality risks (7). Compared with vaginal deliveries, cesarean sections carry a higher number of postpartum complications (9).

Study in UK shows about 33.3% of cesarean sections are repeat procedures (10). Repeat cesarean deliveries are associated with increased morbidity (11). For instance uterine rupture is the most important cause of maternal death during TOLAC. Maternal mortality rate in trial of labor is approximately 1.6 in 100,000live birth (2).
However, the results of several studies in different countries of west Africa shows that trial of labor in carefully selected patients with previous cesarean delivery poses low

level of risk for both the mother and the baby and that its use is an important component of efforts to lower the rate of repeat cesarean birth(12,13,14).

So far little has been done to investigate pregnancy outcome that are specifically associated with pregnant mothers with previous CS scar in JUSH. Thus, this study was done to assess the outcome of pregnancies of previous cesarean section among mothers who had given birth in JUSH Obstetrics ward.

CHAPTER TWO

2.1. LITERATURE REVIEW

World health organization recommendation for cesarean delivery rate worldwide is 5-15% of births. Africa has the lowest (<5%), in Ethiopia population-based cesarean delivery rate was 0.6%, with regional rates varying from 0.2% to 9%. The overall institutional rate was 18%, which varied between 46% in the private for- profit sector and 15% in the public sector (3). There are variations in incidences of pervious cesarean section around the world. For instance the incidence rate is 8.4% in USA University of Chicago (13), 7.5% in University of Benin Teaching Hospital in Nigeria (19), 11% in Muhimbili National Hospital (MNH) in Dares Salaam (14) and 11.2% in Ayub Teaching Hospital, Pakistan (15**).** Previous cesarean section as an indication for repeat cesarean sections is 14% in Kabezi, Burundi, 32.4% in Black Lion Hospital and 16% in JUSH (10, 16, 17).

Previous CS scar pregnancies can be either managed by ERCS, TOLAC (EMCS & VBAC). Different study report shows that the rate of ERCS is 59.6% in USA (13), 35.6% in Muhimbili National Hospital (MNH) in Dares Salaam (14), 34.7% in University of Benin Teaching Hospital in Nigeria (18) and 17.84% in Ayub Teaching Hospital, Pakistan (15).

There is variation in the rate of TOLAC in different parts of the world. The reported rate of TOLAC of 54.9%[EMCS-31% & VBAC-69%] (13), 21.9% [EMCS-35% &VBAC-65%] in Muhimbili National Hospital (MNH) in Dares Salaam (14), 82.8[EMCS 34.7% & VBAC-48.1%] in University of Benin Teaching Hospital in Nigeria (18) and 82.2%(EMCS-25% & VBAC -75%] in Ayub Teaching Hospital ,Pakistan (15).On the other hand a study done at Black line Hospital, Ethiopia the rate of EMCS and VBAC shows 28.8% and 71.2% respectively (19). History of prior vaginal delivery (including prior VBAC), previous indications and intrapartum conditions such as cervical status had been identified to modify TOLAC rates. Moreover admission at more favorable cervical status (e.g, cervical dilation >4 cm, advanced effacement) in spontaneous labor and More than 75% effacement of the cervix at admission also increases the likelihood of VBAC. The incidence of VBAC among people who had TOLAC is approximately 74% in the

United States [12, 21]. The VBAC rate of hospitals in sub-Saharan Africa is between 37 to 97%. A Meta analysis done, in sub-Saharan countries showed a VBAC success rate of 63–75% [20].

The indication for repeat emergency caesarean section in study done in Muhimbili National Hospital in Dares Salaam was labor dystocia (41%) which includes obstructed labor, cephalopelvic disproportional and poor progress of labor (14). However, in Indian rural hospital in which the commonest indications were fetal distress (45.9%) and scar tenderness (18.9%) (26).

Some of maternal complication of previous CS scar includes uterine rupture, hysterectomy, hemorrhage, Endometirits, APH, adhesion, bladder and bowel injury, scar dehiscence and maternal death (1,2).The rate of uterine rupture accounts for 1.1% in USA University of Chicago(13), 0.30% [96% occurred in TOLAC] UK(21), 2% in Muhimbili National Hospital (MNH) in Dare Salaam (14) , 1.5% in University of Benin Teaching Hospital in Nigeria (18), 0.34% in Ayub Teaching Hospital ,Pakistan (15), 2.97% Lagos University Department of Obstetrics and Gynecology, College of Medicine Teaching Hospital in Nigeria(12) and 0.7 % at Ohio State University (22). Scar dehiscence occur in 1.2% of in TOLAC at Ayub Teaching Hospital, Pakistan (15) and in 1.5% of cases with TOLAC at Black line Hospital, Ethiopia (19).

Hysterectomy accounts for 0.28% in ERCS and 0.17 in TOLAC in UK (21), 0.8% in USA University of Chicago(13), 0.8% in University of Benin Teaching Hospital in Nigeria (18), 0.3 % in ERCS and 0.2% in TOLAC at Ohio State University (22).

Some of the study done shows hemorrhage occurs in 0.3-29% TOLAC and ERCS in UK (21). However, the incidence of blood transfusion 0.9% in TOLAC and 1.2% in ERCS at UK(21), 3.9% in EMCS at USA University of Chicago(13), 1% % in ERCS and 1.7% in TOLAS at Ohio State University (22).

Different infection, like Endometirits chorioamnionitis, wound infection, and fever can occur in women who had TOLAC and ERCS. According to some study reports, Endometirits seen in 0.8%–30% TOLAC and 1.2%–18% ERCS at UK [21], 2.9% in TOLAC and 1.8% in ERCS at Ohio State University (22) and failed vaginal births after cesarean 6.4% at USA University of Chicago(13). Wound infection reported to be not statistically significant with the risk of TOLAC and ERCS. The incidence of febrile

morbidity was 6.5% for TOLAC and 7.2% for ERCS at UK [21] chorioamnionitis occurs in 3.8% of women with TOLAC at USA University of Chicago (13).

Women with previous cesarean had a much greater frequency of placental disorders with subsequent pregnancies. In some study done before, placenta previa occurs in 0.44% of pregnancies in Switzerland and 2·4% in Saudi Arabia whereas placental abruption 0.34% pregnancies in Switzerland (23, 24).

Surgical injury is a rare complication during delivery. Secondary data analyses from a multi centered large cohort study suggest that the risk of surgical injury between TOLAC and ERCS is not statistically significantly different [25].

Maternal death can occur in a pregnant lady with previous scar. There was maternal death of 0.02% with TOLAC and 0.04% with ERCS at Ohio State University (22), maternal mortality ratio was 19/100,000 in University of Benin Teaching Hospital in Nigeria (18), but there was no report on maternal death occurred in Lagos University Department of Obstetrics and Gynecology, College of Medicine Teaching Hospital in Nigeria (12) and at Black line Hospital, Ethiopia (19).

Some of fetal and neonatal complication of previous CS scar includes still birth, hypoxic ischemic encephalopathy, low Apgar score and perinatal death. The perinatal mortality ratio was 55 per 1000 live birth in Muhimbili National Hospital (MNH) in Dare Salaam (14), the corrected perinatal mortality rate was 15.2/1000, in University of Benin Teaching Hospital in Nigeria (18), no perinatal death occurred in Lagos University Department of Obstetrics and Gynecology, College of Medicine Teaching Hospital in Nigeria (12) and 29.4 per thousand at Black line Hospital, Ethiopia (19). Hypoxic-ischemic encephalopathy occurred in no infants whose mothers underwent elective repeated cesarean delivery and in 0.07% of infants born at term whose mothers underwent a trial of labor at Ohio State University (22). However, based on the Apgar score of neonate 71.2% of the babies were born with Apgar score > 8 and 24.6% had an Apgar score between 6-8 in Ayub Teaching Hospital, Pakistan (15**)** and the 5th minute Apgar score was 7/10 or more in 94.1% and 6/10 in 4.5% of neonates at Black line Hospital, Ethiopia (19).

2.2 SIGINIFICANCE OF THE STUDY

In modern obstetric practice, pregnancy with history of previous cesarean section is quite common. A cesarean section poses some documented risks to the mothers, fetuses and neonates health in subsequent pregnancies. However, till now there is no documented data on the outcome of pregnancy in pregnant mothers with previous CS scar particularly in JUSH. Thus, the output of this study might be helpful for clinicians to promote factors those can favor the good maternal, fetal and neonatal outcomes in provision of care for mothers with previous CS scar and clinical teaching. Furthermore it may be helpful for organization working on obstetric care to consider during their health planning that can be implemented at Community level and an institutional level to decrease maternal and fetal complications associated with previous CS scar. Finally it may provide additional information for further research in this regard.

2.3 Conceptual frame work

The concepts in this conceptual frame work are developed after review of different literatures, standard books, and protocols and organized according to the major categories.

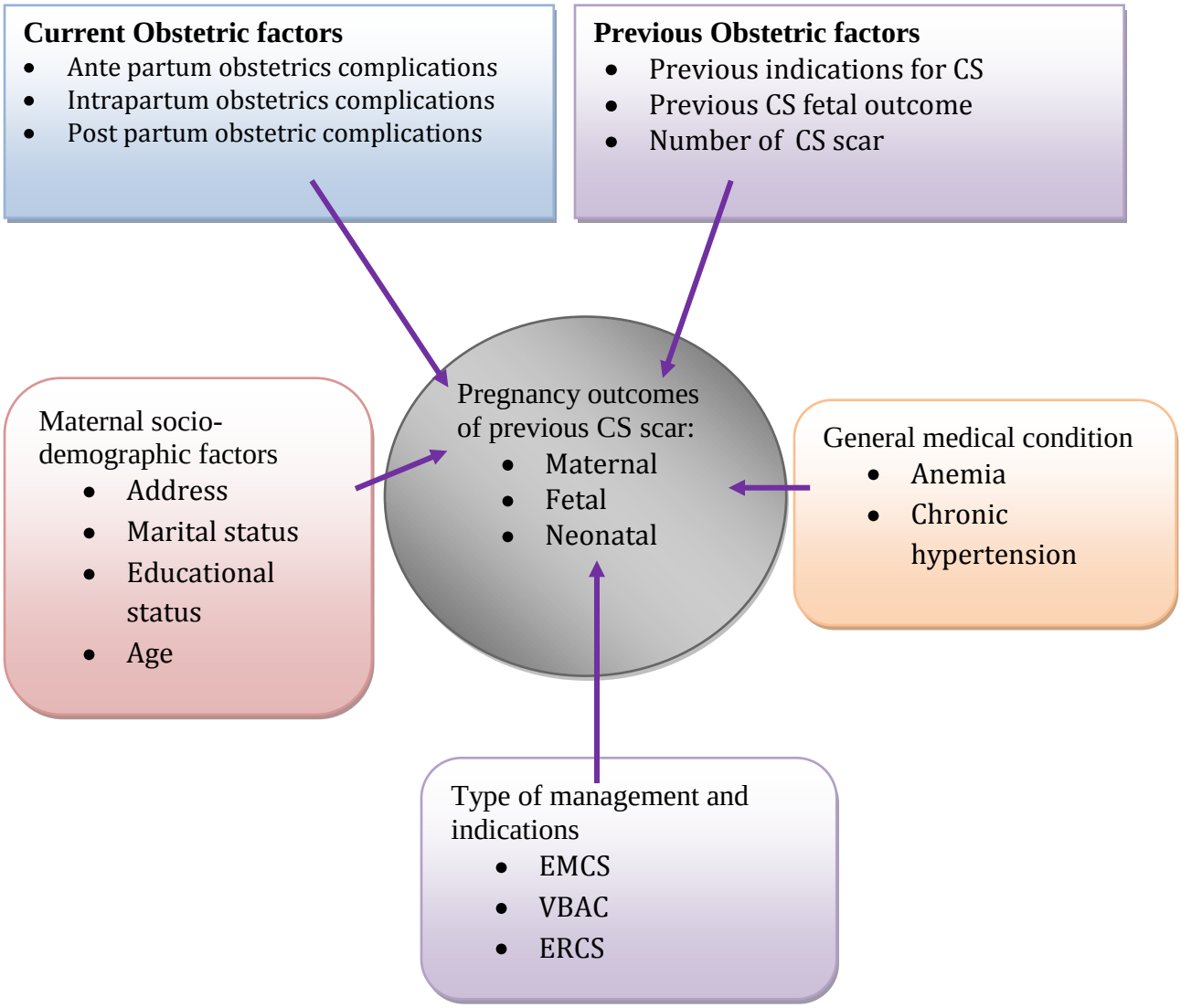

Figure 1: Conceptual frame work on outcome of previous CS scar, February, 2014

CHAPTER THREE: OBJECTIVE

3.1 GENERAL OBJECTIVE

To assess the incidence and pregnancy outcomes of pregnant mothers with previous caesarean section scar in Jimma University Specialized Hospital obstetrics ward from January 1, 2013 – December 31, 2013 south west Ethiopia.

3.2 SPECIFIC OBJECTIVE

1. To determine the incidence rate of pregnant mothers with previous caesarean section scar among mothers attending obstetrics ward in Jimma University Specialized Hospital during study period.
2. To determine maternal outcomes of pregnant mothers with previous caesarean section scar attending obstetrics ward in Jimma University Specialized Hospital during study period.
3. To determine perinatal outcomes of pregnant mothers with previous caesarean section scar attending obstetrics ward in Jimma University Specialized Hospital during study period
4. To identify factors associated with the pregnancy outcome in pregnant mothers with previous caesarean section scar obstetrics ward in Jimma University Specialized Hospital during study period.

CHAPTER FOUR: METHODS AND MATERIALS

4.1 Study area and period

The study was conducted in Jimma University Specialized Hospital Obstetrics ward from January 1, 2013 – December 31, 2013. JUSH is found in Jimma town which is located 357 kms Southwest of Addis Ababa in Oromia regional state. It is one of the oldest teaching hospitals in the country giving services to people living in Jimma zone and serving as a referral hospital in the South-West Ethiopia. It is also serving as a clinical post graduate specialty teaching hospital for Obstetrics and Gynecology, Internal Medicine, Pediatrics & Child Health since 2005 and for Ophthalmology, and in Surgery since 2007. Department of Obstetrics and Gynecology has two wards (Gynecology and obstetrics), one MCH clinic, one Gynecologic OPD, one family planning clinic and referral clinics (Gynecology Oncology, Benign Gynecologic Diseases, and Pregnancy with problem). It has seven consultant Obstetricians & Gynecologists and 33 residents from year I – III.

4.2 Study design

A descriptive cross sectional hospital based study design was used where mothers, fetus/es and neonates were followed after admission until they were discharged from the hospital.

4.3 Source population

All pregnant mothers who attended obstetrics ward in JUSH during the study period.

4.4 Study population

All pregnant women with previous cesarean scar who delivered in obstetrics ward of JUSH from January 1, 2013 – December 31, 2013.

4.5 Inclusion and exclusion criteria

- ✓ Inclusion criteria- All pregnant mothers with previous CS scar who currently delivered by Elective CS, Emergency CS, vaginal deliveries, laparatomy at GA≥28weeks, in JUSH.
- ✓ Exclusion criteria- Pregnant mothers with previous CS scar and managed at JUSH and whose outcome of managements is not known for different reasons (stayed for more than study period or referred to other health institution).

4.6 Sample size determination

- ✓ All pregnant mothers with previous cesarean scar who fulfilled inclusion and exclusion criteria.

4.7 Sampling technique

Pregnant mothers with previous cesarean scar were identified at time of admission to obstetrics ward during the study period. Then mothers who fulfilled inclusion criteria were consequentially included in study without sampling.

4.8. Study variables

4.8.1. Independent variables

- Maternal socio-demographic factors
  - Age
  - Educational status
  - Address
  - Marital status
- Current Obstetric factors
  - ANC
  - Gravidity
  - Parity
  - GA
  - APH
  - Fetal weight
  - Fetal presentation
  - Obstructed labor
  - Multiple pregnancy
  - Stage of labor
  - PIH

- **Previous Obstetric factors**
    - Previous indications for cesarean section
    - Previous fetal outcome
  - General medical condition
    - Anemia
    - Chronic hypertension

4.8.2 Dependent variables

- Outcomes of pregnancies in mothers with previous CS scar :

4.9 Operational definition and definition of terms

- Maternal outcome

  - ✓ Favorable outcome-mothers with no complication regardless of mode of delivery.
  - ✓ Unfavorable outcome- mothers with one or more complication regardless of mode of delivery**.**

- Fetal outcome

  - ✓ Favorable outcome- If no intrapartum complication.
  - ✓ Unfavorable outcome- If there is one or more intrapartum complication**.**

- Neonatal outcome

  - ✓ Favorable outcome- Neonate with no complication after delivery.
  - ✓ Unfavorable outcome- Neonate with one or more complication after delivery.

- Parity – number of deliveries after 28 completed weeks of gestational age.
- Gravidity –number of pregnancy experiences irrespective of the outcome.
- ANC Booked- mother who had at least one visit at any health institution.
- ANC Un booked- mother who had no ANC follow up.
- Apgar Score- a score for a newborn based on appearance, heart rate, grimace, body movement and respiration.

- Criteria for eligibility for VBAC-
    - One previous lower segment cesarean delivery
    - Clinically adequate pelvis
    - No other uterine scars or previous rupture
    - Singleton and estimated fetal weight < 4000 gm
    - No malpresentations
    - Physician immediately available throughout active labor capable of monitoring labor and performing an emergency cesarean delivery.
    - Availability of anesthesia and personnel for emergency cesarean delivery
    - Consented for trial of labor after cesarean
- Successful VBAC-it is normal or instrumental vaginal delivery after previous cesarean section.
- Failed VBAC: - If the alert is crossed for two hours.
- TOLAC-It is mother who underwent either successful VBAC or EMCS for failed VBAC
- ERCD: - Includes scheduled cesarean delivery.

4.10. Data collection instruments and procedures

4.10.1. Data collection instrument

Semi structured questionnaire and document review guide was developed after review of relevant literatures, standard text books and management protocols (1, 2, 12, 13, 14) and adapted to local situation and arranged according to the particular objective it can address. The instrument has four parts:

Part I: Socio demographic information= 8 items

Part-II: Obstetric condition= 19 items

Part III: Maternal morbidity= 8 items

Part IV: Fetal and neonatal outcome=4 items

4.10.2 Data collection procedures

Data was collected through face to face interview of the subjects and review of documents using semi structured questionnaire and document review check list by ten trained year II Obstetrics & Gynecology residents recruited from the same hospital based on their previous data collection experiences.

4.11 Data Quality

The questionnaire was pre-tested on 10 cases two weeks before the actual data collection, possible amendments were done accordingly and those cases were not included in the study. Two days intensive training was given for data collectors by principal investigators on how to fill the questionnaire and review the documents. The filled questionnaire was checked every day for completeness by principal investigator and correction were given for data collectors before the next day data collection.

4.12 Data processing and analysis

The data was coded, cleaned, edited, and fed to computer and analyzed using SPSS for windows 16.0. Bivariate and multivariable logistic regression analysis was done to identify the odds of independent variables. All variable with $P<0.25$ during bivariate binary logistic regression analysis were the candidate for multivariable binary logistic regression analysis to see the independent effect of dependant variable on the outcome variable and significant value were declared at $P< 0.05$. Results were presented using frequency tables, bar graphs and texts. Final interpretation, discussion and recommendation were made based on the findings.

4.13 Ethical consideration

The research was conducted after approval by Jimma University College of public health and medical science ethical clearance board. Verbal informed consent was obtained from every study subject before the interview by explaining the objective of the research. They were also briefed that the study has no harm or pose any risk except it may take time to

respond. All the information collected from the study subjects were handled confidentially through omitting their personal identification, conducting the interview in private place and the data was used for the research purpose only.

1.14 Plan of dissemination

The result will be submitted to the department of obstetrics and gynecology, Jimma University College of public health and medical science, JUSH and presented on scientific presentation auditorium. Further effort will be made for publication on local and international peer reviewed journals.

CHAPTER FIVE: RESULTS

5.1. Socio demographic characteristics

A total of 258 pregnant mothers with previous CS scar had given birth in JUSH maternity and labor ward from January 1, 2013 – December 31, 2013. The study indicated that about half, 131(50.8%) of mothers were in age of 25-29years. The mean age was 26.8years with the standard deviation of 4.29. The study also depicted that191 (74%) were Oromo by ethnicity, 165(64%) were Muslim, 172(66.7%) were house wife, 90(34.9%) were illiterate mothers, 256(99.2) were married and 152(58.9) came from outside Jimma town (**table-1**).

Table 1: Socio demographic characteristics of pregnant women with previous CS scar who delivered in obstetrics ward of JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

Socio demographic variables		Frequency (%) n=258
Address	In Jimma Town	106 (41.1)
	Outside Jimma Town	152(58.9)
Age	20-24	58(22.5)
	25-29	131(50.8)
	30-34	49(19.0)
	35-39	20(7.8)
Ethnicity	Oromo	191(74.0)
	Amahara	26(10.1)
	Gurage	15(5.8)
	Dewaro	9(3.5)
	Tigre	6(2.3)
	Others¥	11(4.3)
Religion`	Muslim	165(64.0)
	Orthodox	67(26.0)
	Protestant	25(9.7)
	Joba	1(0.4)
Occupation	House wife	172(66.7)
	civil servant	41(15.9)
	Farmer	30(11.6)
	Merchant	14(5.4)
	Others	1(0.4)
Education	Illiterate	90(34.9)
	read & write	20(7.8)
	1-8	51(19.8)
	9-12	48(18.6)
	>12	49(19.0)
Marital status	Married	256(99.2)
	Separated	1(0.4)
	Divorced	1(0.4)

¥- Silte, woliyta, Worji, Konta.

5.2. Obstetric Conditions

Regarding obstetrics history the study showed that 168(65.1%) of the mothers had already two to four deliveries, 231(89.5) single previous cesarean scar with interdelivery interval of more than 18 months in 247(95.7%) mothers and 252(97.7%) had ANC follow up of which more than half, 139(55.2%) had at health center. Some of the indication for previous cesarean section were 79(30.6%) unknown (not found), 51(19.8%) cephalopelvic disproportion, 48(18.6%) mal-presentation and 44 (17.1%) NRFHRP. The outcome of previous deliveries was alive in 220(85.3%) of cases **(Table 2).**

Table-2: Past and current obstetrics history of pregnant mothers with previous cesarean section scar in JUSH from January 1, 2013 – December 31, 2013 south west Ethiopia.

Obstetric conditions		Frequency (%)
Parity (n=258)	Para 1	81(31.4)
	Para 2-4	168(65.1)
	Para 5 and above	9(3.5)
ANC (Booked) at (n=252)	Health center	139(55.2)
	JUSH	67(26.6)
	Others	46(18.3)
Number of prior CS (n=258)	1	231(89.5)
	2	26(10.1)
	3	1(0.4)
Indication for previous CS (n=258)	Unknown(not found)	79(30.6)
	CPD€	51(19.8)
	Malpresentation	48(18.6)
	NRFHRP	44(17.1)
	Failed induction	19(7.4)
	Others	17(6.6)
Outcome of previous pregnancy by CS(n=258)	Alive	220(85.3)
	Dead	38(14.7)
Interval b/n CS and current pregnancy (n=258)	6-18 months	11(4.3)
	>18months	247(95.7)
	Mean+SD interdelivery=	4.34+ 2.44
Gestational age (n=258)	Unknown	138(53.5)
	Known	120(46.5)
Known Gestational age (n=120)	<37	17(14.2)
	37-42	91(75.8)
	>42	12(10.0)

5.3. Incidence and mode of delivery of pregnant mothers with previous cesarean section scar

During the last one year there were 3854 total deliveries among which 1353(35.1%) were by cesarean section. Mothers with previous cesarean section scar accounts for 6.69% of the total deliveries and 13.4% of the cesarean deliveries. Out of the total mothers with previous cesarean section scar the rate of repeat emergency CS, vaginal delivery, elective repeat CS, cesarean hysterectomy and laparatomy were 147(57%), 69(26.8%), 34(13.2%), 3(1.2%) and 5(1.9%) respectively(**Figure** 1).

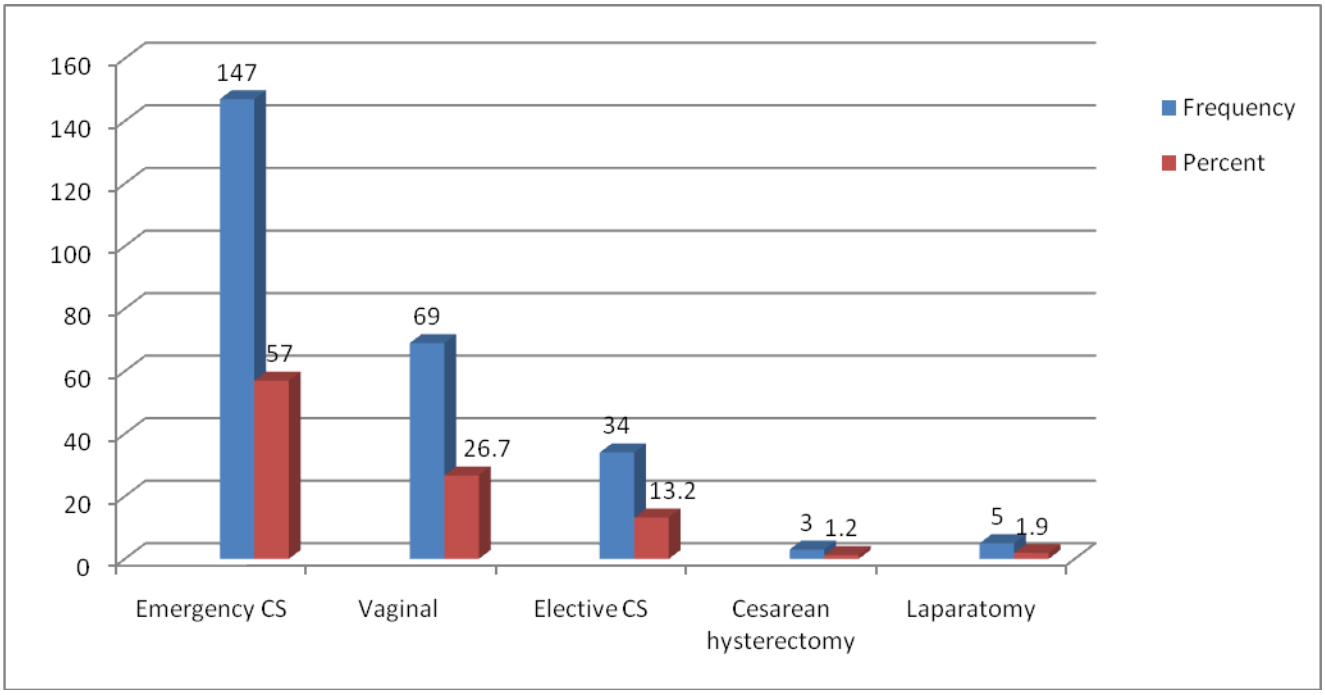

Figure-1: Mode of delivery and management of complication of index pregnancy in mothers with previous CS scar in obstetrics ward of JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

In this study the commonest indications for repeat cesarean deliveries were 37(25.1%) previous cesarean section scar + x-factors (twin, macrosomia, PIH, PROM, declined VBAC, chorioamnionitis…), 32(21.8%) prolonged latent first stage of labor, 24(16.3%) CPD, 18(12.2%) NRFHRP and

10(6.8%) mal-presentations (**Figure 2**).

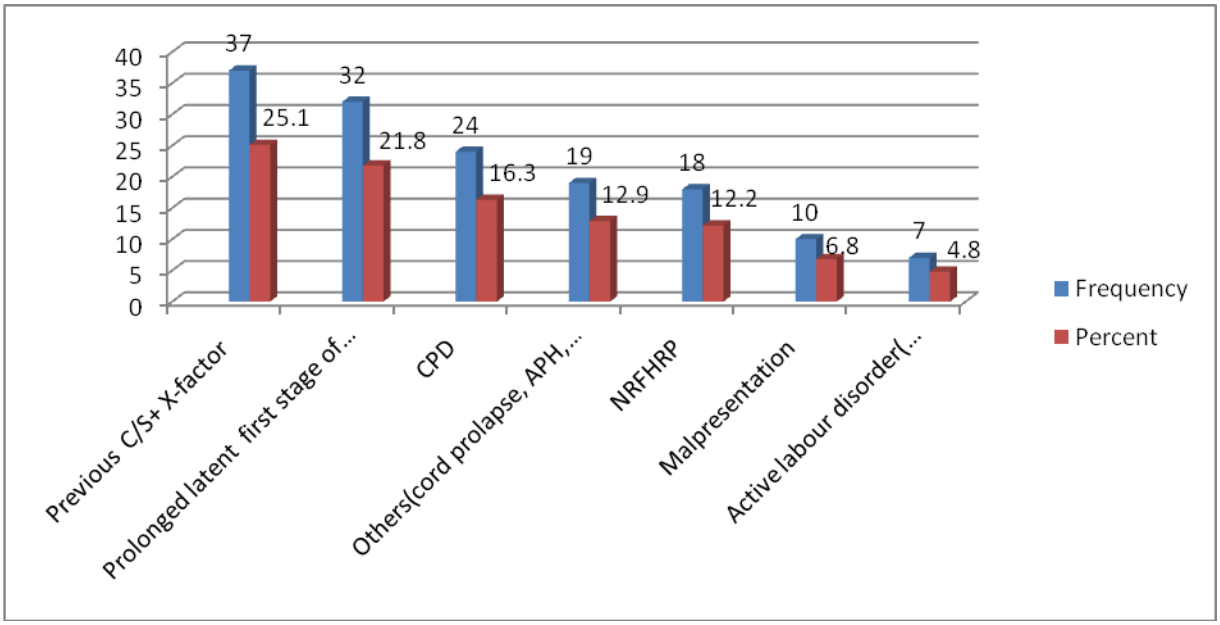

Figure-2: Indications for repeat emergency caesarean section in the index pregnancy in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia

Among 224 mothers who were admitted to labor ward after onset of labor in pregnant mothers with pervious history of CS scar, 153 (68.2%) were eligible for VBAC out of which 132(86.3%) mothers were opted for TOLAC with VBAC success rate of 69(52.3%) and failed VBAC of 63(47.3%). About 80% mothers admitted in latent phase of first stage of labor were delivered by EMCS. The most common indication for cesarean delivery for failed VBAC were 32(50.8%) prolonged latent phase of first stage of labor, 12(19.1%) cephalopelvic disproportion and 7(11.1%) active labor disorder. 21(13.7%) mothers who were eligible for VBAC were opted for repeat cesarean delivery mainly for 14(66.7%) fear of fetal loss, 3(19%) for fear of uterine rupture and 3(14.3%) other reason (**Table-3**).

Table-3: Stage of labor at admission to labor ward and mode of delivery of index pregnancy in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

Stage of labor	Mode of delivery TOLAC				Total
	Successful VBAC		EMCS		
	No	%	No	%	
Latent phase 1st stage	14	20.3	50	79.4	64(48.5%)
Active phase 1st stage	41	59.4	13	20.6	54(40.9%)
2nd stage of labor	14	20.3	-	-	14(10.6%)
Total	69(52.3)	100	63(47.7)	100	132(100%)

5.4 Outcome of pregnancies of mothers with previous cesarean scar

5.4.1. Maternal outcome of pregnant mothers with previous cesarean section scar

Out of the total 258 mothers with previous cesarean scar 46(17.8%) and 212 (82.2%) had Unfavorable and Favorable maternal outcome respectively. Among ante partum complications in pregnant mothers with previous CS scar 15(5.8%) PIH and 3(1.2%) placenta previa were the finding in this study. The intrapartum complications were 5(2.2%) uterine rupture and 2(0.9%) scar dehiscence. Most of the complication encountered during intra operative includes 29(15.3%) adhesion, 3 (1.6%) hysterectomies for PPH and 1(0.5%) iatrogenic bladder injury. The study also showed that 13(7.2%) postpartum hemorrhage, 5(2.8%) endometirits, 2(1.1%) wound infection, 1(0.5%) wound dehiscence and death of one patient (0.5%) during postoperative course. Postpartum hemorrhage 5(7.3%) was the only complication encountered in those mothers with successful VBAC (table-4).

Table-4: Patterns of complication in pregnant mothers with previous cesarean section in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia

Category	Variables	Frequency (%)
Ante partum complication (n=258)	PIH	15(5.8)
	Placenta previa	3(1.2)
	Chronic hypertension	2(0.8)
	Anemia	1(0.4)
	Others ⟐	3(1.2)
Intra partum complication (n=224)	NRFHRP	18 (8.0)
	Uterine Rupture	5 (2.2)
	Scar Dehiscence	2(0.9)
	Others ¥	4(1.8)
Complication with vaginal delivery(n=69)	PPH	5(7.3)
Intra op complication occurred(n=189)	Adhesion	29(15.3)
	Hysterectomy	3(1.6)
	Bladder injury	1(0.5)
Post op complication(n=189)	PPH	13(6.9)
	Endometirits	5(2.7)
	Wound infection	2(1.1)
	Wound dehiscence	1(0.5)
	Others ©	3(1.6)
	Death	1(0.5)

◈-malaria, upper respiratory tract infection, cystitis ¥- chorioaminionitis, vaginal bleeding, ©-pneumonia, mastitis, UTI.

Comparing maternal morbidity in mothers who undergone EMCS after failed TOLAC with ERCS, major complications including 1(1.6%) hysterectomy 6(9.5%) PPH, 2(3.2%) Endometirits and 1(1.6%) death were common in EMCS after failed TOLAC. Even though statistically it is not significant all complications were more common in those mothers who underwent EMCS on arrival (**Table-5**).

Table-5: Maternal complications by mode of delivery of index pregnancy in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

Maternal complication	Mode of delivery				Total
	Elective repeat cesarean section	Emergency cesarean section on arrival	Emergency cesarean section for failed trial of labor	Successful vaginal delivery	
Adhesion	3(10.3)	15(51.7)	11(37.9)	-	29(46.0)
Bladder injury(iatrogenic)	-	1(100)	-	-	1(1.6)
Hysterectomy	-	2(66.7)	1(33.3)	-	3(4.5)
PPH	1(5.9)	6(35.3)	6(35.3)	5(29.4)	18(28.6)
Wound infection	-	2(100)	-	-	2(3.2)
Wound dehiscence	-	1(100)	-	-	1(1.6)
Endometirits	-	3(60)	2(40)	-	5(7.9)
Others◈	1(33.3)	2(66.7)	-	-	3(4.5)
Death	-	-	1(100)	-	1(1.6)
Total	5(7.9)	32(50.8)	21(33.3)	5(7.9)	63(100)

◈=Urinary tract infection, Mastitis

5.4.2. Fetal and neonatal outcome

Out of the total 258 mothers with previous cesarean section scar 29 (11%) and 235 (89%) had Unfavorable and Favorable fetal outcome respectively, while 27(10.7%) and 226(89.3%) had Unfavorable and favorable neonatal outcome respectively. Some of fetal and neonatal complication identified in this study includes 11(4.3%) stillbirth, 10(4.1%)

early neonatal sepsis 4(1.6%) neonatal asphyxia, 3(1.2%) MAS and 4 (1.6%) early neonatal deaths. The hospital perinatal mortality rate was 3.75 per 1000 total births with adjusted perinatal mortality rate of 3.5 per 1000 total births, still birth rate of 2.75 per 1000 total births and early neonatal death of 1.1 per 1000 live births. More than 90% of neonate had a birth weight of 2500gram and above. Based on the Apgar score of neonates 206(81.4) of the babies were born with first minute Apgar score of ≥7 with the mean Apgar score of 7 and standard deviation of 1.01. 251(99.2) neonates had fifth minute Apgar score of ≥7 with mean Apgar score of 9 and standard deviation of 0.63(**Table-6**).

Table-6: Perinatal outcome of pregnancies with previous CS in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

Category	Variables	Frequency (%)
Condition fetus at birth(n=264)	Alive	253(95.8)
	Dead	11(4.2)
Weight in grams(n=264)	1000-2499	13(4.9)
	2500-3999	239(90.5)
	> or= 4000	12(4.6)
Neonatal complication (n=253)	Early onset neonatal sepsis	10(4.0)
	Neonatal asphyxia	4(1.6)
	MAS	3(1.2)
	Others€	6(2.4)
	Dead	4(1.6)
	No complication	226(89.3)
1st minute APGAR score (n=253)	< 7	47(18.6)
	≥ 7	206(81.4)
5th minute APGAR score (n=253)	< 7	2(0.8)
	≥ 7	251(99.2)

€-neonatal jaundice, preterm, cephal hematoma,

The study depicted that more than half of fetal death, 6(54.5%) were caused by mechanical causes (five uterine rupture and one obstructed). Fetal deaths were more common among those mothers who had antenatal care (**table-7**).

Table-7: Causes of fetal death (Aberdeen classification) by their ANC follow in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

Causes of fetal death	Ante natal care		Total
	Booked	Unbooked	
Mechanical causes	6(100)	-	6(54.5)
Unexplained causes	2(66.7)	1(33.3)	3(27.3)
Lethal congenital anomalies	1(100)	-	1(9.1)
PIH complicated by APH	1(100)	-	1(9.1)
Total	10(90.9)	1(9.1)	11(100)

5.6.1. Factors associated with maternal outcome of pregnant mothers with previous cesarean scar

Logistic regression analysis was done to identify factors associated with maternal outcome of mothers with previous CS scar. Educational status, indication for previous CS scar, parity, stages of labor at admission and ante partum complication were not significantly associated with maternal outcome. On bivariate binary logistic regression address, duration of hospital stay, Place of ANC attendance, eligibility for VBAC, Intra-partum complications and those who were opted for VBAC were significantly associated with maternal outcome in pregnant mothers with previous CS scar at P-value of < 0.05. On multivariate logistic regression analysis eligibility for VBAC and Intra-partum complication are significantly associated with pregnant mothers with previous CS scar adjusted for the other variable. Pregnant mothers who were eligible for TOLAC are 3.5 times likely to have favorable outcome with 95%CI for AOR of 1.7-7.4 and mothers without intra-partum complication had 4.5 times more likely to have favorable outcome as compared to those with complication with 95%CI for AOR of 1.8-11.6(**Table 8**).

Table-8: Bivariate analysis of factors associated with maternal outcome of pregnant mothers with previous cesarean scar in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

Variable		Maternal outcome		COR/95%CI/P	AOR/95%CI/P
		Unfavorable	Favorable		
Address ((n=258)	Jimma	12(4.7)	94(36.4)	1	-
	Outside Jimma	34(13.2)	118(45.7)	0.4(0.2-.9)0.03	
Hospital stay (258)	<=1 day	3(1.2)	60(23.3)	1	-
	2-3 days	7(2.7)	17(6.6)	0.1(0.03-0.5).01	
	>3 days	36(14.0)	135(52.3)	0.1(0.1-0.6).01	
Place of ANC attendance(252)	JUSH	6(2.4)	61(24.2)	1	-
	Health Center	29(11.5)	110(43.7)	0.4(0.2-0.9)0.04	
	Others	9(3.6)	37(14.7)	0.4(0.1-1.2)0.1	
Eligible for TOLAC(258)	Yes	19(7.4)	134(51.9)	2.44(1.3-4.8)0.02	3.5(1.7-7.4)0.01
	no	27(10,5)	78(30.2)	1	-
TOLAC(132)	Successful VBAC	5(3.8)	64(48.5)	1	-
	EMCS	12(9.1)	51(38.6)	0.3(0.1-1.0)0.041	
Intrapartum complication (258)	yes	14(5.4)	15(5.8)	1	
	No	26(10.1)	150(58.1)	5.4(2.3-12.5)0.0	4.5(1.8-11.6).002

5.6.2. Factors associated with fetal outcome of pregnant mothers with previous cesarean scar

Logistic regression analysis was done to identify factors associated with fetal outcome of pregnant mothers with previous CS scar. Ante partum complication, previous pregnancy outcome and parity were not significantly associated with fetal outcome. On bivariate binary logistic regression Intrapartum complication, place of ANC attendance, TOLAC and Gestational age were significantly associated with fetal outcome in pregnant mothers with previous CS scar at P-value of < 0.05. On multivariate logistic regression analysis intrapartum complication is significantly associated with previous CS scar adjusted for the other variable at P-value of < 0.001(**Table-9**).

Table-9: Bivariate analysis of factors associated with Fetal outcome of mothers with previous cesarean scar in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

Variable		Fetal outcome		COR/95%CI/P	AOR/95%CI/P
		Unfavorable	Favorable		
Place of ANC attendance (252)	JUSH	3(1.2)	64(25.4)	1	
	Health Center	17(6.7)	122(48.4)	0.3(0.09-1.2)0.043	-
	Others	7(2.8)	39(15.5)	0.3(0.06-1.1)0.04	-
TOLAC (132)	Successful VBAC	6(4.5)	63(47.7)	1	
	EMCS	13(9.8)	50(37.9)	0.4(0.1-1.0)0.03	-
Intrapartum complication (258)	Yes	24(9.3)	5(1.9)	1	
	No	4(1.6)	172(66.7)	206(52-822)0.00	89.5(74-163)0.00
Gestational age(120)	<37wks	4(3.3)	13(10.8)	1	
	37-42wks	6(5.0)	85(70.8)	4.4(1.1-17.6)0.01	-
	>42wks	1(0.8)	11(9.2)	3.4(0.3-35.0)0.03	-

5.6.3. Factors associated with neonatal outcome of pregnant mothers with previous cesarean scar

Logistic regression analysis was done to identify factors associated with neonatal outcome of pregnant mothers with previous CS scar. Gestational age and previous pregnancy outcome were not significantly associated with neonatal outcome. On bivariate binary logistic regression neonatal weight, 1st minute Apgar score and Intrapartum complication were significantly associated with neonatal outcome in mothers with previous CS scar at P-value of < 0.05. On multivariate logistic regression analysis 1st minute Apgar score and neonatal weight between 2500gm and 3999gm are significantly associated with previous CS scar adjusted for the other variable at P- value of <0.05. Neonate who had 1st minute APGAR score of greater or equal to 7 had 5.7 times more likely to have favorable outcome as compared to those with Apgar score of < 7 at 95%CI for AOR of 1.9-16.8 and neonate who had birth weight of 2500-3999gm had 5.6 times more likely to have favorable outcome as compared to those with birth weight of < 2500gm at 95%CI for AOR of 1-32.9(**Table -10**).

Table-10: Bivariate analysis of factors associated with Neonatal outcome of mothers with previous cesarean scar in JUSH, January 1, 2013 – December 31, 2013 south west Ethiopia.

Variable		Neonatal outcome		COR/95%CI/P	AOR/95%CI/P
		Unfavorable	Favorable		
Weight of neonate (n= 253)	<or=2499gm	5(2.0)	8(3.2)	1	1
	2500-3999grm	19(7.5)	209(82.6)	7.0(2.1-23.7).002	5.6(0.9-32.9)0.04
	>or=4000gm	1(0.4)	11(4.3)	6.9(0.7-70.8)0.04	-
1st minute Apgar score(n=253)	<7	15(5.9)	40 (15.8)	1	1
	>or=7	10(4.5)	188 (74.3)	6.8(2.9-16.3)0.00	5.7(1.9-16.8).002
Intrapartum complication(n=253)	Yes	6(2.4)	27(10.7)	1	-
	No	18(7.1)	202(79.8)	3.6(1.2-10.4)0.02	

CHAPTER SIX: DISCUSSION

This study was conducted with intention of assessing the incidence and pregnancy outcomes of pregnant mothers with previous caesarean section. The incidences of pregnant mothers with previous CS scar and success rate of VBAC in this study were 6.69% and 52.3% respectively. Maternal complication seen in pregnant mothers with previous CS scar includes uterine rupture, hysterectomy, postpartum hemorrhage, Endometirits, iatrogenic bladder injury, wound infection, scar dehiscence and one maternal death with case fatality rate of 0.39%. The hospital perinatal mortality rate is 3.75 in 1000 birth, still birth rate of 2.75 in 1000 births and early neonatal death of 1.1 in 1000 live birth.

The incidence of previous CS scar was 6.69% from all deliveries. This is lower than reports from USA, University of Chicago -8.4 %(13), University of Benin Teaching Hospital in Nigeria-7.5 %(18), Muhimbili National Hospital (MNH) in Dares Salaam-11% (14) and in Ayub Teaching Hospital, Pakistan-11.2% (15**).** These discrepancies can be attributed to higher sample size and extended duration of study in former reports**.** The proportion of repeat CS due to previous CS scar from all Cesarean deliveries was 13.4% which is almost similar with previous study done in JUSH-16%(16) and in Kabezi, Burundi-14%(17), but lower than that of Black Lion Hospital 32.4%(10) it could be due to fear of medico-legal issue with complication that occur during TOLAC.

The rate of EMCS in the current study after failed VBAC was 47.7%. These imply that there is significant proportion of pregnant mothers who had failed TOLAC. This is higher than similar study reports around the world .It is higher than reports from Muhimbili National Hospital (MNH) in Dares Salaam 31% (14), University of Benin Teaching Hospital in Nigeria 34.7% (18), Ayub Teaching Hospital ,Pakistan 25% (15) and Black line Hospital, Ethiopia 28.8 (19). These variations may be due to the difference in the sample size, duration of study and JUSH is the only referral hospital in south west Ethiopia accepting referral & non referral cases. The rate of successful VBAC in this study was 52.3% which is lower than reports from USA -69%(13) in Muhimbili National Hospital in Dares Salaam-65%(14), Ayub Teaching Hospital ,Pakistan-75% (15) and Black line Hospital, Ethiopia - 71.2% (19). These differences can be due to early admission at latent first stage of labor and abandoned augmentation.

The proportion of elective repeat cesarean section in this study is 13.2% which is lower than reports from USA-59.6% (13), Muhimbili National Hospital (MNH) in Dares Salaam-35.6% (14), University of Benin Teaching Hospital in Nigeria-34.7% (18) and Ayub Teaching Hospital, Pakistan-17.84% (15). This could be due to the presentation of pregnant mothers with previous cesarean scar after the onset of labor even though they had indication for elective cesarean delivery which is evidenced by increased number of mothers who undergone emergency cesarean section for the indication of previous cesarean scar + x-factors.

From this study the most common indication for emergency repeat cesarean section are previous one cesarean section + x-factors(25.1%), prolonged latent first stage of labor(21.8%) and cephalopelvic disproportional(16.3%) which is similar with study done in Muhimbili National Hospital in Dares Salaam (41%: obstructed labor, cephalopelvic disproportional and poor progress of labor), PIH/ eclampsia -10% , post term pregnancy -3.9%, premature rupture of membranes -9.5% and multiple pregnancy -2.2 (14).

Uterine ruptures rate is 2.2% in women with previous CS scar in this study which is higher than the other reports in Nigeria and Tanzania which shows 1.5% and 2% respectively (14, 18). However, scar dehiscence (0.9%) is lower than that of Black lion hospital (1.5%) and Ayub Teaching Hospital (1.2%); this can be attributed to increased cases of uterine rupture all which were occurred before arrival to JUSH.

Higher proportion of hysterectomy (1.6%) and wound dehiscence (0.5%) in this study as compared to others (Benin Teaching Hospital in Nigeria, UK, and USA) (13, 18, 21) because most of complicated cases underwent EMCS and JUSH is the only hospital in which complicated cases are managed in south west Ethiopia.

There is similar finding regarding endometirits (2.7%), post partum hemorrhage (6.9%) and wound infection (1.1%) in our study as compared to the others. Similarly all this complications were common in EMCS (13, 21, 22).

In this study there is similar case fatality rate of 0.39% when compared with university of Benin teaching Hospital in Nigeria (case fatality rate of 0.3%)(18) but higher than that of

Black Lion Hospital where there is no maternal death (19). This could be due to higher sample size and late arrival of patients after complication happened.

In some study done before, placenta previa occurs in 0.44% of pregnancies in Switzerland and 2·4% in Saudi Arabia (23, 24). Similarly this study depicted that placenta previa among pregnant mothers with previous cesarean scar was occurred in 1.2%cases.

Perinatal mortality rate (3.75 in 1000 birth) is lower than the ratio reported in different teaching hospital including Black Lion Hospital (19). However, there are reports from Lagos University Department of Obstetrics and Gynecology, College of Medicine Teaching Hospital in Nigeria where there is no perinatal death occurred (12). The first and fifth Apgar score is similar with reports from different country and Black Lion Hospital (12, 14, 18, 15, 19). Over all the decreased in perinatal death, good first and fifth minute Apgar score could be due to for fear of complication, early decision for failed trial of scar and early intervention as it can be explained by increased EMCS.

Even if the study was conducted prospectively over one year, it would have been better if more extended years of study were conducted to get better information to suggest the outcome of event. In addition it would have been also better if maternal conditions before onset of labor, aseptic technique in hospital and ward nursing care were addressed to make it more comprehensive to understand the outcome of pregnant mothers with previous cesarean section scar.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7:1 CONCLUSION

1. The study revealed lower incidence rate of pregnant mothers with pervious cesarean section scar with variety of complications to mothers, fetus/es and neonates.
2. The incidence rate of pregnant mothers with previous cesarean section scar in JUSH is 6.69% and accounts for 13.4% of cesarean delivery.
3. The major mode of delivery in pregnant mothers with previous cesarean section scar at JUSH is repeat emergency cesarean section (57%).
4. Success rate of vaginal birth after cesarean in JUSH is 52.3%.
5. The overall favorable outcome of mothers, fetus/es and neonates in mothers with previous cesarean section scar regardless of mode of delivery in JUSH are 82.2%, 89% and 89.3% respectively.
6. The major intrapartum and postpartum complications in pregnant mothers with previous cesarean section scar are NRFHRP, uterine rupture, scar dehiscence, hysterectomy, bladder injury, postpartum hemorrhage, endometirits, wound infection, and wound dehiscence.
7. Hospital perinatal mortality rate are lower.
8. Maternal address, eligibility for TOLAC, intrapartum complication, neonatal weight and 1st minute Apgar score are significant independent predictors of maternal, fetal and neonatal outcome in pregnant mothers with previous cesarean section scar at JUSH.

7.2 RECOMMENDATIONS

1. Strengthen ante natal care and intra-partum follow up.
2. Practice of TOLAC should be encouraged in pregnant mothers with previous cesarean section scar.
3. All health care providers working in JUSH maternity ward should keep all maternal records which provide relevant information for better clinical decision of mothers with previous cesarean section scar.
4. On discharge advice should be given for mothers about the complication which can occur if they labor at home in subsequent pregnancy.
5. Finally, farther extended period of study should be carried out to address other additional predictors that may affect the outcome of pregnancy in pregnant mothers with previous caesarean section scar.

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26. Outcome of post caesarean pregnancy and comparison of maternal and foetal outcome following vaginal birth versus repeat caesarean section in a rural hospital, JNMC, Sawangi, Wardha, India2013 Mar;2(1):16-22

QUESTIONNAIRE

JIMMA UNIVERSITY FACULTY OF MEDICAL SCIENCES, DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, QUESTIONNAIRE FORMAT ON INCIDENCE, MATERNAL AND NEONATAL OUTCOME OF PREGNANT WOMENN WITH PREVIOUS CESAREAN SCAR DELIVERIES IN OBSTETRICS WARD OF JUSH, JIMMA, SOUTH WEST ETHIOPIA, JANUARY,2012.

PART I – SOCIODEMOGRAPHIC INFORMATIONS

1. Age in years …….. Card number……..
2. Address …… date of admission ……Date of discharge……..
3. Ethnicity 1) Oromo 2) Amahara 3) Tigre
   4) Garage 5) Dawro 6) others (specify)……
4. Religion 1) Orthodox 2) Protestant
   3) Muslim 4) others (specify)…….
5. Occupation 1) House wife 2) Civil servant (employee)
   3) Farmer 4) Merchant 5) others (specify)…….
6. Educational status 1) Illiterate (can't read & write) 2) Read &write only
   3) Grade 1-8 4) Grade 9-12 5) Grade >12 (specify)……
7. Marital status 1) Married 2) Separated 3) Divorced 4) Widowed
8. Income of the family per month _____Birr.

PART-II OBSTETRIC CONDITION

1. Parity……..
2. ANC follow up….. 1. Yes 2. No
3. If yes for question number 2. Where was it?
   1. JUSH 2. Health center 3. Others (specify)……..
4. Gestational age…….

1) From LNMP (if known)……in weeks.
2) If unknown- i. Length of amenorrhea……. ii. Early U/S……
   iii. Fundal height……

5. Number of previous c/s…….
6. Indication for previous c/s……..
   1. Non Reassuring Fetal Heart Rate Pattern
   2. Cephalopelvic Disproportion
   3. Malpresentation
   4. Failed induction 5. Placenta previa 6. Previous two CS
   7. Previous one CS+x_factor 8. Cord prolapsed 9. Obstructed labor

10. Unknown 11. Others (specify)……

7. Outcome of previous pregnancy. 1. Alive 2. Dead
8. Interval between c/s and current pregnancy……in years.
9. Ante partum complication during the index pregnancy.
    1. Pregnancy induced hypertension
    2. Ante partum hemorrhage 3. Anemia
    4. Scar tenderness 5. Others (specify) ……..
    6. None
10. Was she admitted to maternity ward? 1. Yes 2. No
11. If yes, reason for admission…….
12. Phases of labor at admission to labor ward.
    1. Latent 1st stage of labor
    2. Active 1st stage of labor
    3. 2nd stage of labor
13. Was she eligible for VBAC? 1. Yes 2. No
14. . If yes, for question number 13 1. Opted for VBAC. 2. Opted for repeat C/S
15. Reason for opted for repeat CS:
    1. Fear of fetal loss 2. Uterine rupture 3. Others……..
15. Total duration of labor…….in hours
16. Intrapartum complication…….
    1. Vaginal bleeding 2. Lower abdominal tenderness
    3. Non Reassuring Fetal Heart Rate Pattern 4. Scar dehiscence
    5. Uterine rupture 6. Others…….
    7. No complication
17. Mode of delivery of index pregnancy.
    1. Normal delivery 2. Vacuum delivery
    3. Forceps delivery 4. Elective c/s
    5. Emergency c/s 6. Laparatomy
18. In those who opted for VBAC.
    1. Successful VBAC 2. Failed VBAC.
    3. Underwent emergency c/s
19. Indication for emergency c/s?
    1. Imminent uterine rupture 2. Non Reassuring Fetal Heart Rate Pattern
    3. Protracted labor 4. Arrest of labor

5. Prolonged latent phase of labor

6. Cephalopelvic Disproportion 7. Previous CS + X-factors

8. Malpresentation 9. Obstructed labor

10. Others (specify)…….

PART III-maternal morbidity

1. Was there any complication during and after vaginal delivery? 1. Yes 2. No

2. If yes for question number 18, what was the complication?

1. Post partum hemorrhage 2. Retained placenta 3. Endometirits

4. Blood transfusion

5. Others (specify)……....

3. Was there intra operative complications? 1. Yes 2. No

4. If yes, for Q.1 what was the complication?

1. Adhesion 2. Imminent rupture 3. Bladder injury

4. Hysterectomy 5. Bowel injury 6. Blood transfusion

7. Others (specify)……. 8. None

5. Was there postoperative complication? 1. Yes 2. No

6. If yes, for Q. 3.what was the complication?

1. Post partum hemorrhage 2. Wound infection

3. Wound dehiscence 4. Endometirits 5. Others (specify)……

7. Pre op and post op HCT……and…….respectively

8. Estimated blood loss……in ml (for both vaginal and cesarean delivery).

PART IV: Neonatal outcome

1. Condition at birth? 1. Alive 2. Dead
2. If dead, causes of death…….
3. If alive- 1. APGAR score in the 1st and 5th minute ……and ……..respectively.

2. Weight…….in gram.

4. Any neonatal complication.

1. Sepsis 2. Neonatal asphyxia

3. MAS 4. Others (specify)……..

5. No complication. 6. Dead ……cause of death……..

Name of data collector_____

Signature_____

Date_____